

Piano Technician I

PEIMS Code: N1170197

Abbreviation: PINTECH1

Grade Level(s): 9-10

Award of Credit: 1.0

State Approved Innovative Course

- Districts must have local board approval to implement innovative courses.
- In accordance with Texas Administrative Code (TAC) §74.27, school districts must provide instruction in all essential knowledge and skills identified in this innovative course.
- Innovative courses may only satisfy elective credit toward graduation requirements.
- Please refer to [TAC §74.13](#) for guidance on endorsements.

Course Description:

The Piano Technician I course introduces piano tuning and technical skills with an emphasis on parts of the piano, tuning theory, tuning hammer technique, introduction to pitch references/devices, interval tuning, string replacement, and an introduction to basic business management skills. The Piano Technician I course will introduce students to the knowledge, skills, and technologies related to employment in the music industry as a piano tuner or piano technician. Students will begin to develop ear training skills and the physical dexterity to manipulate tuning tools in order to tune intervals. Students will learn tuning theory, string repairs/replacement, action repair, financial literacy, professional conduct, and OSHA safety protocols.

Upon successful completion of the set of Piano Technician courses, the skills taught will allow students to begin advanced study at trade or postsecondary schools, as well as begin working at institutions and piano dealers as a fully competent piano technician.

Essential Knowledge and Skills:

- (a) General Requirements. This course is recommended for students in Grades 9-12. Recommended prerequisite completion of any middle school music course. Recommended corequisite: any high school music course. Students shall be awarded one credit for successful completion of this course.
- (b) Introduction.
 - (1) Fine arts instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in the current piano tuning/technician profession.
 - (2) The Piano Technician I course introduces piano tuning and technical skills with an emphasis on parts of the piano, tuning theory, tuning hammer technique, introduction to

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pitch references/devices, interval tuning, string replacement, and an introduction to basic business management skills. The Piano Technician I course will introduce students to the knowledge, skills, and technologies related to employment in the music industry as a piano tuner or piano technician. Students will begin to develop ear training skills and the physical dexterity to manipulate tuning tools in order to tune intervals. Students will learn tuning theory, string repairs/replacement, action repair, financial literacy, professional conduct, and OSHA safety protocols.

- (3) Students are encouraged to participate in extended learning experiences such as shop projects, private lessons in piano tuning, and group lessons in related topics.
- (c) Knowledge and Skills.
 - (1) The student demonstrates professional conduct as required by the music industry. The student is expected to:
 - (A) use clear, concise, and efficient communication techniques in both written and oral contexts;
 - (B) develop acceptable work habits in reporting for duty on time and performing required tasks satisfactorily and completely;
 - (C) demonstrate professional expectations such as dressing appropriately, speaking politely, and observing manners commensurate with community standards; and
 - (D) explain the necessity of reviewing all aspects of assigned work for qualitative and quantitative processes and end products.
 - (2) The student evaluates methods to reduce sources of workplace hazards in order to promote a safe working environment. The student is expected to:
 - (A) describe hazard identification steps including inventory, work site inspection, and review of the potential dangers associated with various materials and chemicals found in workplaces;
 - (B) perform a root cause analysis and describe the methods associated with the analysis;
 - (C) identify accident types such as preventable or life-threatening as well as those caused by human error; and
 - (D) describe the elements of a workplace health program.
 - (3) The student describes the parts of the piano and their function and explains piano tuning theory. The student is expected to:
 - (A) identify proper nomenclature for parts of the piano, including essential components of the piano action, keyboard, pedal mechanisms, soundboard bridge, pinblock, strings, string bearing components, and cabinetry;
 - (B) identify piano keys correctly using International Pitch Notation (IPN);
 - (C) explain the natural overtone series in music;
 - (D) describe equal temperament tuning; and
 - (E) define the Pythagorean comma and the comma.
 - (4) The student explains the function and application of the tools, equipment, technologies, and materials used in piano tuning and repair. The student is expected to:

- (A) identify industry standard safety protocols in shop workspaces and while using piano technician tools and equipment;
 - (B) identify appropriate personal protective equipment while tuning, repairing, and moving pianos;
 - (C) identify referencing pitches with a tuning fork and with an electronic tuning device;
 - (D) explain and demonstrate how to hold the tuning hammer properly, allowing for the correct setting of the tuning pin;
 - (E) describe the correct positions of the tuning hammer to provide appropriate leverage on the tuning pin;
 - (F) describe the theory of near coincident partials;
 - (G) describe the theory of inharmonicity;
 - (H) explain how changes in string tension affect neighboring strings through the down bearing on the bridge/soundboard;
 - (I) explain how the components of the internal mechanism known as the action interact with each other as a complex mechanism.
- (5) The student identifies musical intervals used in piano tuning and performs basic tuning of pure (untuned) intervals. The student is expected to:
- (A) identify, both aurally and visually (on the keyboard), the musical intervals of a unison, major third, perfect fourth, perfect fifth, and an octave;
 - (B) explain the association of the set of all white keys (or natural keys) of the piano with the diatonic scale;
 - (C) explain the association of the set of all black keys (or sharps and flats) of the piano with the pentatonic scale;
 - (D) explain the association of the combination of both white keys and black keys with the chromatic scale.
 - (E) identify when an audible beat is present with the tuning of unisons to the appropriate pitch (i.e., a pitch of the specified interval) indicative of an impure unison, and making appropriate adjustment in order to improve the unison;
 - (F) identify when an audible beat is present, with the tuning of octaves in the 4th and 5th registers of the piano, tuning octaves to the appropriate pitches indicative of an impure octave, and make appropriate adjustments in order to improve the octave;
 - (G) distinguishes between the musical intervals of perfect fourths and perfect fifths, experimenting with the tuning of pure (untuned) perfect fourths and pure perfect fifths to the appropriate pitches and identifying when an audible beat is present, indicative of an impure fourth or fifth, and make appropriate adjustments in order to make the interval more pure;
 - (H) identify when an audible beat when tuning pure major thirds to the appropriate pitches (indicative of an impure major third) and make appropriate adjustments in order to make the interval more pure.

- (6) The student explains the procedure to replace a piano string correctly and safely according to industry standards. The student is expected to:
 - (A) explain the importance of forming the coil and beckett;
 - (B) demonstrate making the coil with 3-4 clockwise turns;
 - (C) explain the importance of the correct string path through the hitch pins, bridge pins, and agraffes;
 - (D) explain the procedure, including safety measures, to splice strings; and
 - (E) explain and demonstrate the correct procedure to create a hitch pin loop.
- (7) The student demonstrates the fundamentals of business practices, bookkeeping, and marketing strategies including maintaining records, using accounting software, online marketing, and creation of a website. The student is expected to:
 - (A) assess and monitor financial well-being using financial statements;
 - (B) develop an income statement by track income and expenses;
 - (C) create a budget that incorporates short-, medium-, and long-term financial goals;
 - (D) explain the importance of maintaining an active record of work on paper;
 - (E) create mock invoices for work performed according to scenarios by following proper formatting guidelines, and itemizing services and costs necessary descriptors; and
 - (F) create a website.
- (8) The student researches career opportunities for piano technicians and demonstrates career management skills. The student is expected to:
 - (A) identify employment opportunities as a piano technician;
 - (B) develop a resume;
 - (C) demonstrate proper interview techniques in various situations; and
 - (D) create and complete appropriate documents such as electronic portfolio, letters of reference, and thank you letters.
- (9) The student explains different small business entities and describes how each might function in the instrument maintenance industry. The student is expected to:
 - (A) explain the differences between sole proprietorships, partnerships, and corporations;
 - (B) identify factors affecting profit, revenue, and expenses in various business models; and
 - (C) evaluate the suitability of various small business entities on the basis of the requirements, costs, and liabilities associated with the formation of the entity as well as the needs of a small piano tuning and servicing business.

Recommended Resources and Materials:

Resources

- Collection of good and poor condition pianos
- Collection of piano tuning levers and piano tuning mute strips and felts
- Piano action regulating tool sets
- Piano stringing tool sets
- Various screwdrivers
- Socket set
- Drill index
- Various piano bushing cauls and felts
- Mobile worktables and tool carts
- Various industry related jigs
- Stock parts
- Action models by various manufacturers
- Various woodworking tools-- bandsaw, standing belt sander, standing drill press, planer (hand and machine), routers, hand drills
- Dust collection systems

Technology

- iPad with tuning apps: Cybertuner™, Verituner™, TuneLab™ and PiaTune™
- Reyburn Piano Services, Inc. (2019) Cybertuner™ (version 7.9.2) [Mobile application software]
 - Veritune, Inc. (2018) Verituner™ (version 4.7.7) [Mobile application software]
 - Real-Time Specialties (2017) TuneLab Piano Tuner™ (version 4.3.1) [Mobile application software]
 - HAKKI BAYKA (2018) PiaTune™ (version 2.1) [Mobile application software]

Instructional Materials

Grec, M. *Pianos Inside Out: A Comprehensive Guide to Piano Tuning, Repairing and Rebuilding*. Mandeville, LA: In Tune Press, 2013.

Potter, R. *The Piano Action Handbook*. Kansas City, MO: Piano Technicians Guild Foundation Press, 1991.

Reblitz, A. A. *Piano Servicing, Tuning and Rebuilding: A Guide for the Professional, Student, and Hobbyist*. Lanham: Rowman & Littlefield, 2019.

Travis, J. W. *A Guide to Restrunging*. Takoma Park, MD: J.W. Travis, 1982.

Kottick, E. L. *The Harpsichord Owners Guide: A Manual for Buyers and Owners*. United States: The University of North Carolina Press, 2013.

The Piano Technicians Guild Foundation Press. (2019) *The Piano Technicians Journal*.

Recommended Course Activities:

- Piano tuning practice
- Daily lectures in tuning theory
- Tuning and repair one-on-one lessons

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- Tuning and repair group lessons
- Masterclasses from visiting technicians
- Attend existing workshops
- Practicum tuning and repairing pianos within the campus or district
- Internship at university piano technician programs and/or local area piano retailers

Suggested methods for evaluating student outcomes:

Students will be evaluated based upon results obtained from measurements made from exacting industry standard jigs, guides, and listening devices, with their grades calculated and recorded based upon syllabus standards.

- Tuning Hammer Technique—Demonstrates proper holding of the tuning hammer that allows for correct setting of the pin.
- Tuning Stability—Demonstrates setting the pin in such a way that allows for no cent variation when hit at a FFF Blow.
- Active Work Record—Maintains an active record of work on paper and online using digital record keeping systems.
- Shop Safety—Follows assigned safety protocols in shop workspaces.
- Parts and Design—Properly identifies various parts of the piano and can use proper nomenclature.
- Unison Tuning—Demonstrates accurate tuning with no variance or less than 1 cent variance.
- Octave Tuning—Demonstrates accurate tuning with less than 1 cent variance WIDE or demonstration of perfect 12th.
- 4th Tuning—Demonstrates accurate tuning with 1 beat per second WIDE.
- 5th Tuning—Demonstrates accurate tuning with less than 1 cent NARROW.
- 3rd Tuning—Demonstrates accurate tuning by continually building in speed during chromatic 3rd scales, evenly and slowly.

Teacher qualifications:

An assignment for Piano Technician I-IV is allowed with one of the following certificates.

- All-Level Music.
- Grades 6-12 or Grades 9-12--Music.
- Junior High School (Grades 9-10 only) or High School--Music.
- Music: Early Childhood-Grade 12.
- Secondary Music (Grades 6-12).
- Trade and Industrial Education: Grade 6-12.
- Trade and Industrial Education: Grade 8-12.

Experience as a Master Piano Technician as determined by recognized manufacturer's standards is required as is certification in Piano Technology from a recognized school or an apprenticeship program through a recognized piano manufacturer (Steinway, Kawai, Boesendorfer and Yamaha).

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Additional information:

- Additional training through collaboration with the University of Houston Moores School of Music Master Piano Technician program. Due to the collaborative nature of our relationship with the Moores School of Music, some training will be included at no additional cost.
- Additional training through collaboration with Steinway Piano Gallery, piano retailers, as well as Steinway & Sons, piano manufacturers. Due to the collaborative nature of our relationship with Steinway Piano Gallery and Steinway & Sons, some training will be included at no additional cost. There will be piano technician trainings at the Steinway & Sons factory. Anticipated additional training costs \$6,000 to cover travel and expenses at the Steinway factory in Queens, New York.